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Identification of Compressive Fluctuations in the Solar Wind Inertial Range KRISTOPHER KLEIN, GREGORY HOWES, University of Iowa — As a means of understanding the compressive components of turbulent large scale solar wind fluctuations, we have created sets of synthetic data based upon spectra of linear MHD or kinetic eigenmodes. At the scales of interest, these models are dependent on the plasma β_i, the relative fraction of energy in the fast and slow modes, and the angular power distributions of said modes. Using the correlation between density and parallel magnetic fluctuations as a measurement of the compressive behavior we can directly compare the synthetic data to in-situ satellite measurements. In doing so, we find results consistent with almost all of the compressive energy being in the kinetic slow mode. While there is good agreement between satellite data and the kinetic models, none of the fluid MHD models properly fit the satellite measurements. An examination of the angular power distribution indicates that the slow wave energy is strongly anisotropic in a preferentially perpendicular direction. These findings have implications for our understanding of the turbulent cascade as energy progresses to smaller scales, as a plasma devoid of fast mode energy would preferentially evolve to kinetic Alfven rather than whistler waves. Future work will entail creating similar synthetic data sets at these smaller scales to determine the characteristic wave modes.

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